

With numerous figures.

20.

CLINICAL LECTURE

ON

RUPTURE OF THE BLADDER

AND ITS TREATMENT

DELIVERED AT THE MIDDLESEX HOSPITAL IN JULY, 1879

BY

HENRY MORRIS, M.A., M.B., F.R.C.S.

SURGEON TO, AND LECTURER ON ANATOMY AT, THE MIDDLESEX HOSPITAL

(REPRINTED FROM *The Medical Times and Gazette*.)

LONDON

PARDON & SONS, PRINTERS, PATERNOSTER ROW

1879

CLINICAL LECTURE
ON
RUPTURE OF THE BLADDER
AND ITS TREATMENT

DELIVERED AT THE MIDDLESEX HOSPITAL IN JULY, 1879

BY

HENRY MORRIS, M.A., M.B., F.R.C.S.

SURGEON TO, AND LECTURER ON ANATOMY AT, THE MIDDLESEX HOSPITAL

(REPRINTED FROM *The Medical Times and Gazette.*)

LONDON
PARDON & SONS, PRINTERS, PATERNOSTER ROW
—
1879



CLINICAL LECTURE ON RUPTURE OF THE BLADDER AND ITS TREATMENT.

GENTLEMEN,—On Friday, June 6, 1879, William H., aged thirty-nine, a spare man, of middle height, was admitted into Broderip ward under my charge. Many of you saw him soon after his admission, when he was in a condition of much danger. He has returned to-day, as requested, and will tell you that he is now quite well. The following report is abridged from the notes taken by Mr. Harratt, the dresser:—

The patient is an upholsterer by trade. On Wednesday evening, June 4, he was drinking at a public-house, when some difference arose between him and another man, which they thought they ought to settle by wrestling. The patient was thrown with much force, and whilst lying with his back on the ground his opponent knelt with both knees upon the lower part of his abdomen. William H. seems to have lost consciousness for a little time, but on “coming to” he with much difficulty walked home and went to bed, taking over an hour to do the distance, which is about one mile. He tried several times to pass water, and could not; but within an hour or two after getting into bed he voided a small quantity of blood. He was visited by a doctor twice during the night and the next day, who ordered hot fomentations to the abdomen, and effervescing draughts to check sickness, and recommended his removal to the hospital. The patient stated that prior to the injury he had not passed water for “an hour or two,” and that he had been drinking up to the

pain to-day in hypogastrium; the tenderness in this region is more considerable than it has been during the last few days, but the induration is somewhat less. There is a free thick white discharge by the side of the catheter, and no urine is flowing through the catheter. On removing the catheter it was found plugged with muco-pus. No. 10 catheter was introduced, and about three ounces of clear urine drawn off. Ordered to continue the pills and hot fomentations. The bladder is to be washed out with warm water containing a few drops of a mixture of eight grains of thymol in two ounces of glycerine.

14th.—The patient complained of so much increase of pain in the hypogastrium after the injection that it is not to be repeated; it was only used once. He passed this morning a stool consisting only of opaque, gelatinous matter like the white of egg, which, on boiling with liquor potassæ, became quite clear. Urine contains pus; specific gravity 1015.

16th.—Bowels open slightly this morning, the action being attended with much pain. Examined per rectum: no induration or thickening about the bowel, which is full of soft yellow solid fæces. Up to yesterday the urine had been pretty clear, but on re-introducing the catheter this morning a quantity of thick, dirty-looking pus first passed, and then clear urine flowed. The tenderness and induration in the hypogastrium are less pronounced. Feels very low and hungry. Ordered a simple enema, and a mixture containing chloric ether, spirits of ammonia, and tincture of calumba; still continuing the pills and the hot fomentations. Is to have chicken for dinner to-morrow. The catheter is no longer to be fixed in the bladder, but to be introduced two or three times daily if patient cannot micturate without it. *Vespere*: Temperature 101·6°; pulse 96. Bowels acted freely after the enema. Stools normal. Passed urine voluntarily after a little straining. The urine was thick and opaque, being largely charged with pus, and became very ammoniacal on standing.

From this time the notes show an almost uninterrupted progress towards recovery. The catheter was not again required. The amount of pus in the urine, which for

several days was large, gradually diminished. The induration behind the hypogastric wall gradually cleared away, and the pain, distension, and tenderness of the abdomen ceased.

On June 26 the urine was acid, and contained neither blood, pus, nor albumen, though there was a slight deposit of mucus. On June 30 he was allowed to get up, and the next day to go into the hospital garden. On July 2 there was a slight reappearance of pus, but on the 9th this had again quite disappeared, and the urine was acid, specific gravity 1015, and free from albumen, but contained a slight excess of phosphates. Ordered one-grain doses of quinine, three times a day, in place of the mixture containing bicarbonate of potash, tincture of hyoseyamus, mucilage, and infusion of calumba, which he had taken since June 20.

On July 10 the patient left the hospital, quite well, but weak.

Remarks.—What was the nature of the injury which had happened to this man? In my own opinion and in that of my colleagues and others who saw him there was no reason to doubt that the lesion was one of rupture of the bladder. It may be said that the existence of such an injury, unless the rent be actually seen, is a matter of inference rather than of absolute knowledge; and so difficult is the diagnosis considered by some to be, that nothing short of an examination after death is sufficient to remove their scepticism with regard to any particular case.

But if we look to the various works on Surgery we find fairly uniform accounts of the symptoms, prefaced by some such remark as—* “The symptoms of a ruptured bladder are sufficiently evident”; or,† “The symptoms of rupture of the bladder, when uncomplicated by fracture, are generally quite unmistakable”; or,‡ “The injury usually reveals itself by well-marked symptoms, both general and local.”

Now, here was a man who had been violently hurt in the hypogastrium whilst his bladder was moderately, if not

* Erichsen.

+ Holmes.

‡ Gross.

more than moderately, distended. He had been drinking freely, so that the normal tension of the abdominal wall was relaxed (the muscles were off their guard, so to speak), and that part of the bladder which is in relation to the front of the abdomen consequently all the more exposed to the violence. The injury was followed immediately by collapse, pain in the hypogastrium, and by several fruitless efforts to micturate. After a little while vomiting and hiccup set in, and the abdomen became distended. At length, after several hours, first a little blood, and then some blood-stained urine were voided, but with great difficulty; while the pain in the abdomen became more widely diffused and the distension increased. Added to all this it must be borne in mind that only three-quarters of a pint of urine and blood was discharged from the bladder in the first thirty-six hours after the injury; and that when a catheter was introduced, which was done without difficulty, less than four ounces of urine were withdrawn.

All surgical writers are agreed that these are the leading symptoms to which rupture of the bladder has given rise; and as, unfortunately, the opportunity of verifying the diagnosis has been afforded in nearly all cases by the death of the patient, the inference based upon such symptoms in any given case amounts well-nigh to absolute certainty. Further in support of the inference in the present case is the fact that within six days after the injury there was well-marked thickening of the tissues in front of the bladder, and that within six days more there was a free discharge of pus from the bladder. All this indicates that the inflammatory process which was taking place outside the bladder, as evidenced by the thickening felt through the abdominal walls, had gone on to suppuration, and that pus was being poured through the rent into the cavity of the bladder.

The next thing to determine was the situation of the rent, because both treatment and prognosis depend to a certain degree upon this. Was it extra- or intra-peritoneal? Or, in other words, was it in front, at the fundus, posterior wall, or the neck of the bladder? Rupture at the fundus, or of the posterior wall (unless quite low down), if complete, must

necessarily extend through the peritoneum ; in the other situations the peritoneum is usually uninjured, though it may be, and often has been, involved.

According to the well-known figures of Dr. Stephen Smith, the posterior wall suffered in fifty out of sixty-five cases, in which the situation of the rent was noted, from which it would seem that the chances are more than three to one that the peritoneum will be injured. This proportion is probably higher than a larger number of cases will support. Thus, from 166 cases collected by Dr. Max Bartels,* the summary notes of which have been translated by Mr. Lyell, I make out the following to have been the results:—

Intra-peritoneal, total, 98 ; 94 deaths, and 4 recoveries.

Extra-peritoneal, total, 54 ; 42 deaths, and 12 recoveries.

State of peritoneum not mentioned, total, 14 ; 13 deaths, and 1 recovery.

In 84 of the intra-peritoneal cases the rupture was situated as follows:—40 at the fundus, 9 in front near the fundus, 33 posteriorly, and 2 at the side.

In 15 cases the rupture was associated with fracture of the pelvis.

In 50 of the extra-peritoneal cases the rupture was situated:—19 at the neck, 23 anteriorly, 2 behind, and 6 at the side.

In 19 instances the rupture was complicated with fracture of the pelvis ; in 8 of which splinters of bone penetrated the bladder, and were either voided with the urine or removed by lithotomy.

In 6 of the doubtful cases the pelvis was also fractured, and in 2 of the 6 a splinter penetrated the bladder.

It appears evident that when the peritoneum is injured, the fundus or posterior wall, or both, are nearly always the seat of rupture ; sometimes the anterior wall and the fundus are involved. When the peritoneum escapes, the neck or anterior wall is the part of the bladder which suffers. This is exactly what would be expected from the anatomical relations of the peritoneum.

If the wound be entirely extra-peritoneal, the urine will

* Archiv. für Klin. Chir. vol. xxii. Dr. Max Bartels enumerates 169, but three of these are duplicates.

escape into the cellular tissue of the pelvis, and pelvic cellulitis and possibly pelvic abscess will arise.

If intra-peritoneal, the urine will escape into the cavity of the abdomen, and general peritonitis will most probably occur. Extravasation of urine into the peritoneal cavity is not necessarily fatal. The injurious effects which follow from extravasation of urine in cases of stricture of the urethra have not always been excited by the escape of healthy urine from a torn bladder, because healthy urine has not the same irritating properties as decomposing urine. The absence of peritonitis when urine has been for some time in the abdominal cavity was proved by the post-mortem examination of the following case which came under my notice in 1870:—

Charles A., aged sixty-four, fell downstairs, and afterwards was unable to pass any urine. The next day he applied for surgical assistance; the catheter was used, and some blood-coloured fluid was drawn off. The catheter was not left in the bladder, but was passed every eight hours up to the time of the man's death. He died on the third day after the injury.

I made the post-mortem examination on a warm, dry day in April, sixteen hours after death. Body of large frame, stout, thick-set. Abdominal walls fatty. Great lividity of thighs, and generally of depending parts. There was not a trace of peritonitis, but the cavity of the abdomen contained about two pints of brownish-yellow, blood-stained urine. A small patch of ecchymosis was noticed on the part of the intestine lying near the site of injury. The kidneys were large and fatty. The pericardium and heart were covered with a thick layer of fat.

The walls of the bladder were uniformly thin, soft, and very lacerable. On the right side posteriorly there was a large opening, sufficient to admit a good-sized hen's egg. The outer margin of this opening was irregular and thickened; and hanging loosely over the opening was a flap of peritoneum, the edges of which looked as if they had been more recently torn. The rent in the peritoneum was continued upwards as far as the outer margin of the

right *rectus abdominis*. At this part of the rupture the peritoneum was separated from the sub-peritoneal fat on either side of the rent for an inch in extent. Below and behind the lower extremity of the opening into the bladder the peritoneum was torn for half an inch. Still further down the serous membrane was thin and stretched. From the inner surface of the bladder the rent was seen to have its long axis from below upwards and toward the right side.

It appeared that the rupture of the bladder-wall had not been complete in the first instance, but that the mucous and muscular coats only had given away, and that the peritoneum had been detached by sub-peritoneal extravasation before it yielded, so as to allow of the escape of the urine into the peritoneal cavity. Or, possibly, the appearances were due to the fact that the bladder was distended at the time of rupture, and contracted when examined after death. Be this as it may, however, blood-stained urine was, at the time of death at any rate, found in the peritoneal cavity, and yet no inflammation of the serous membrane had been excited.

The ease with which the peritoneum can in some cases be peeled away from the subjacent tissue is well known, and explains the occasional occurrence of one form of the reduction *en bloc* of hernia. It also accounts for those large sub-peritoneal and retro-peritoneal abscesses and accumulations of urine, the results of extravasation, which have been described in several of the reported cases of rupture of the bladder.

The question whether the peritoneum has or has not suffered is difficult to answer from an examination of the symptoms. It may, however, be safely conjectured that the peritoneum is torn, if within twenty-four or thirty-six hours after the injury the abdomen becomes very tense; if the bladder can neither retain nor expel its contents; if a catheter on entering the bladder and drawing off a little clear urine can be passed further on and then draws off bloody urine, which ebbs and flows as the patient breathes; and if when warm water is injected through the catheter it is felt by the patient in his groins and abdomen. It is true that in some rare cases the peritoneum has been lacerated and yet the

bladder has preserved some power of expelling and retaining urine. This is no doubt due to one of two causes—either the wound in the bladder is high up in the organ, or at least above the level at which the ureters open into it; or the mucous membrane overlaps the opening in the other coats of the bladder sufficiently to shut off the cavity of the bladder from that of the peritoncum.

In our patient, W. H., there is no doubt the wound was in the front wall of the bladder chiefly, though perhaps not entirely extra-peritoneal, and being high up in the organ comparatively little urine escaped through the rent, while the bladder preserved some of its power of retaining and expelling its contents. A limited amount of inflammation and suppuration was excited around the edges of the wound, whereby the opening in the bladder was ultimately closed.

The prognosis of ruptured bladder is most unfavourable, still it is not necessarily fatal. Several cases of recovery have been recorded, and although it is true that in the majority of these the rent was extra-peritoneal, yet some high authorities support the opinion that the peritoneum tolerates the presence of healthy urine, and even think it not improbable that urine may be absorbed after its escape into the peritoneal cavity.

In Dr. Max Bartels' list there are seventeen recoveries out of 166 cases, and if we add the two cases above described and a case recently recorded by Mr. C. Heath we have eighteen recoveries out of 169 cases. This is a most gloomy picture, it is true; still it suffices to give us some encouragement in the management of these accidents. In the most favourable case, a fortnight or more must elapse, even if all goes well, before we are justified in encouraging our patient, or the patient's friends, in thinking that all danger is passed. Although the injury has been almost immediately fatal in some few instances—the patient dying within half an hour, and in a larger number within forty-eight hours—yet in others death has been postponed until the fourteenth, fifteenth, eighteenth, twenty-fifth, and even the thirty-second day. In the majority of cases death takes place in from two to eight

days. In those instances which do not terminate within a fortnight, death is usually preceded by suppuration or sloughing of the perivesical cellular tissue. In some cases in which a sub- or retro-peritoneal cavity has been formed, the cavity has been tapped or cut into, and death for a time averted by the evacuation of the urinous and purulent contents; in other such cases the peritoneum has given way, the pent-up fluid has escaped into the abdomen, and fatal peritonitis has been thus set up.

The question of treatment is most important. At a recent meeting of the Medico-Chirurgical Society* a discussion was raised on a case of rupture of the bladder brought forward by Mr. Christopher Heath. The advisability of opening the abdomen so as to sponge out the abdominal cavity and free it of all extravasated urine, and then to close the rent in the bladder by means of sutures, was considered. This plan has been adopted by Walter of Pittsburg, by Mr. Willett at St. Bartholomew's Hospital, and by Mr. Heath at University College Hospital, but only Walter's patient recovered. Another operation, suggested and successfully put into practice by W. J. Walker of Boston, and afterwards by Dr. Erskine Mason, is cystotomy, whereby a free vent for the urine in a depending position is established. Each of these operations is very serious; and neither ought, in my opinion, to be undertaken, except with a feeling of the greatest certainty as to the nature of the accident, and of the uselessness of all less formidable modes of treatment. Moreover, to my thinking, these are not alternative operations; each is not suitable in the same case, and neither would be anything but harmful in many. For instance, in the case now referred to, if I am right in supposing that the rent was at the front and upper part of the bladder chiefly, though not entirely extra-peritoneal, and that the amount of urine extravasated was small, what would have been the use of abdominal section or cystotomy? The wound in the bladder could not have been closed through the abdomen without doing the very thing which increases the mortality of the accident—viz., making the peritoneal cavity communicate with the wound

* February 25, 1879.

in the bladder, or extending such communication if it exist. Nor would the urine extravasated at the fundus of the bladder have escaped through the opening in the perinæum if cystotomy had been performed, while that operation was not required to prevent further extravasation than had occurred at the time of the accident.

If the wound be in the lower part of the bladder, and the urine extravasated into the cellular tissue between the bladder and rectum, cystotomy would, I think, be a very proper operation, whether the rent in the bladder extended or not through the peritoneum.

But if the rent be fairly within the peritoneal area of the bladder, cystotomy would complicate without improving matters. It is in these latter cases, if in any, that abdominal section should be practised, but the operation holds out no hope of success, that I can see, beyond what is afforded by milder treatment. I should prefer to content myself by drawing off from the peritoneal cavity the extravasated urine by means of a long catheter passed through the rent in the bladder, and afterwards washing out the abdominal cavity by injecting warm water. A catheter should be retained just within the neck of the bladder, so as to prevent any accumulation of urine, and the patient should be kept as quiet as possible under the influence of opium given in small doses; only the smallest possible amount of food or fluid should be introduced into the stomach, and sickness and thirst should be allayed by a little ice to suck. Unless the rent in the peritoneum is very low down, the abdominal cavity, having been once cleared of urine in the manner suggested, or by the aspirator (as was successfully done in a case reported by Dr. Macdougall of Carlisle), may be kept free from fresh extravasation by the retention of the catheter in the bladder. If, on the other hand, the rent be on a level with or a little below the openings of the ureters, then urine will continue to escape into the peritoneal cavity in spite of the presence of a catheter, unless the lax mucous membrane acts like a valve to close the aperture in the other coats of the bladder. Neither abdominal section nor cystotomy would be successful in preventing fresh extravasation. Cystotomy

would only make another opening (and one probably less free than the rent) for the escape of urine, below the orifices of the ureters; while as to abdominal section, the physical difficulties to completely closing the wound in the bladder when its position is very low are, as they were proved to be in two cases in which the attempt has been made, very great, because the bladder cannot be drawn up sufficiently far for stitches to be introduced effectively at the lowest part of the wound.

I advise you, then, if you have to treat a patient who is suffering from a rupture of the bladder, to content yourselves with the milder measures I have recommended, and on no account to resort to either of the operations—abdominal section or cystotomy—unless you have reason for thinking, from the presence of tumefaction about the rectum, or some other condition, that the rent is near the neck of the bladder, in which case I consider cystotomy would be indicated.



